In the Claims:

Please amend the claims as follows:

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1. (currently amended) A ~~computer-implemented~~ method for inserting digital data into a digital television (DTV) broadcast signal, the DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, the method comprising:

encoding the digital data as codewords; and

replacing data segments within the DTV signal with the codewords.

2. (currently amended) The method of claim 1 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

3. (currently amended) The method of claim 1 ~~2~~ wherein the step of encoding the digital data as codewords comprises:

dividing the digital data into bit sequences; and

encoding each bit sequence as a corresponding codeword selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence.

4. (previously presented) The method of claim 3 wherein the codewords in the finite set are orthogonal to each other.

5. (previously presented) The method of claim 3 wherein the bit sequences are all of the same length.

6. (previously presented) The method of claim 3 wherein the codewords in the finite set are a same length as the data segments.

7. (previously presented) The method of claim 3 wherein the step of replacing data segments with codewords comprises:

replacing each data segment with at least two codewords.

8. (previously presented) The method of claim 3 wherein:

each bit sequence is N bits long, and

there are 2^N codewords corresponding to the bit sequences.

9. (previously presented) The method of claim 3 wherein the step of encoding each bit sequence as a corresponding codeword comprises:

selecting the codeword from a lookup table which matches bit sequences with their corresponding codewords.

10. (previously presented) The method of claim 3 wherein each codeword represents not more than three bits of digital data.

11. (previously presented) The method of claim 3 wherein each codeword comprises multi-amplitude symbols.

12. (currently amended) The method of claim 1 ~~2~~ wherein the step of replacing data segments with codewords comprises:

selecting data segments according to their numerical position within a frame; and

replacing only the selected data segments with codewords.

13. (currently amended) The method of claim 1 ~~2~~ wherein the step of replacing data segments with codewords comprises:

determining whether a data segment is unused; and

replacing only unused data segments with codewords.

14. (previously presented) The method of claim 1 further comprising:
broadcasting the DTV signal.

15. (previously presented) The method of claim 14 further comprising:
receiving the broadcast DTV signal; and
recovering the digital data from the received DTV signal.

16. (previously presented) A method for recovering digital data from a broadcast digital television (DTV) signal, comprising:
receiving a broadcast DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, wherein at least one data segment has been replaced by at least one codeword representing digital data;
selecting the data segments which have been replaced by codewords; and
recovering the digital data from the selected data segments.

17. (currently amended) The method of claim 16 wherein the DTV signal comprises a signal selected from the group consisting of:
an American Television Standards Committee (ATSC) DTV signal;
a Digital Video Broadcast (DVB) DTV signal; and
a Direct Broadcast Satellite (DBS) DTV signal.

18. (currently amended) The method of claim 16 ~~17~~ wherein:
each codeword is selected from a finite set of codewords wherein:
each codeword corresponds to a specific bit sequence,
the codewords are all of the same length, and
each codeword is longer than its corresponding bit sequence; and
the step of recovering the digital data from the selected data segments comprises recovering the bit sequences from the selected data segments.

19. (previously presented) The method of claim 18 wherein the codewords in the finite set are a same length as the data segments.

20. (previously presented) The method of claim 18 wherein the step of recovering the bit sequences from the selected data segments comprises:

identifying which of the data segments in the received DTV signal have been replaced by codewords; and

for data segments identified as having been replaced by codewords:

correlating the data segment against a template for each codeword in the finite set of codewords; and

selecting the codeword corresponding to the template which produces the strongest correlation peak.

21. (previously presented) The method of claim 20 wherein the template for a codeword is a matched filter for the codeword.

22. (previously presented) The method of claim 20 wherein:

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position within a frame; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises determining which of the data segments occupy the preselected numerical positions within the frame.

23. (previously presented) The method of claim 20 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

correlating the data segments against a template for the field synchronization segment;

accumulating the correlations to produce N partial sums, each partial sum reflecting a sum of peaks of every Nth correlation;

determining which of the N partial sums is the largest to identify the field synchronization segment; and

determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.

24. (previously presented) The method of claim 20 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

correlating the data segments against a template for the field synchronization segment;

generating N counts from the correlations, each count reflecting a number of times every Nth correlation exceeds a threshold;

determining which of the N counts is the largest to identify the field synchronization segment; and

determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.

25. (previously presented) A DTV transmitter device for inserting digital data into a digital television (DTV) broadcast signal, the DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, the DTV transmitter device comprising:

means for encoding the digital data as codewords; and

means for replacing data segments within the DTV signal with the codewords.

26. (currently amended) The DTV transmitter device of claim 25 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

27. (currently amended) The DTV transmitter device of claim 25 ~~26~~ wherein the means for encoding the digital data as codewords comprises:

means for dividing the digital data into bit sequences; and

means for encoding each bit sequence as a corresponding codeword selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence.

28. (previously presented) The DTV transmitter device of claim 27 wherein the codewords in the finite set are orthogonal to each other.

29. (previously presented) The DTV transmitter device of claim 27 wherein the codewords in the finite set are a same length as the data segments.

30. (previously presented) The DTV transmitter device of claim 27 wherein:

each bit sequence is N bits long, and

there are 2^N codewords corresponding to the bit sequences.

31. (currently amended) The DTV transmitter device of claim 25 ~~26~~ wherein the means for replacing data segments with codewords is further for:

selecting data segments according to their numerical position within a frame; and

replacing only the selected data segments with codewords.

32. (currently amended) The DTV transmitter device of claim 25 ~~26~~ wherein the means for replacing data segments with codewords is further for:

determining whether a data segment is unused; and

replacing only unused data segments with codewords.

33. (previously presented) A DTV receiver device for recovering digital data from a broadcast digital television (DTV) signal, comprising:

means for receiving a broadcast DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, wherein at least one data segment has been replaced by at least one codeword representing digital data;

means for selecting the data segments which have been replaced by codewords; and

means for recovering the digital data from the selected data segments.

34. (currently amended) The DTV receiver device of claim 33 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

35. (currently amended) The DTV receiver device of claim 33 ~~34~~ wherein:

each codeword is selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence; and

the means for recovering the digital data from the selected data segments comprises means for recovering the bit sequences from the selected data segments.

36. (previously presented) The DTV receiver device of claim 35 wherein the codewords in the finite set are orthogonal to each other.

37. (previously presented) The DTV receiver device of claim 35 wherein the bit sequences are all of the same length.

38. (previously presented) The DTV receiver device of claim 35 wherein the codewords in the finite set are a same length as the data segments.

39. (previously presented) The DTV receiver device of claim 35 wherein the means for recovering the bit sequences from the received DTV signal comprises:

means for identifying which of the data segments in the received DTV signal have been replaced by codewords; and

for data segments identified as having been replaced by codewords:

means for correlating the data segment against a template for each codeword in the finite set of codewords; and

means for selecting the codeword corresponding to the template which produces the strongest correlation peak.

40. (previously presented) The DTV receiver device of claim 39 wherein the template for a codeword is a matched filter for the codeword.

41. (previously presented) The DTV receiver device of claim 39 wherein:

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position within a frame; and

the means for identifying which of the data segments in the received DTV signal have been replaced by codewords comprises means for determining which of the data segments occupy the preselected numerical positions within the frame.

42. (previously presented) The DTV receiver device of claim 39 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the means for identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

means for correlating the data segments against a template for the field synchronization segment,

means for accumulating the correlations to produce N partial sums, each partial sum reflecting a sum of peaks of every Nth correlation,

means for determining which of the N partial sums is the largest to identify the field synchronization segment, and

means for determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.

43. (previously presented) The DTV receiver device of claim 39 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the means for identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

means for correlating the data segments against a template for the field synchronization segment,

means for generating N counts from the correlations, each count reflecting a number of times every Nth correlation exceeds a threshold,

means for determining which of the N counts is the largest to identify the field synchronization segment, and

means for determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.

44. (currently amended) A DTV receiver device for recovering digital data from a broadcast digital television (DTV) signal, comprising:

a front end adapted to receive ~~for receiving~~ a broadcast DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, wherein data segments have been replaced by codewords representing digital data and the codewords are selected from a finite set of codewords; and

a bank of correlators coupled to the front end and adapted to correlate ~~for correlating~~ the data segments against templates for codewords from the finite set of codewords.

45. (currently amended) The DTV receiver device of claim 44 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

46. (currently amended) The DTV receiver device of claim 44 ~~45~~ wherein:

each codeword is selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence.

47. (currently amended) The DTV receiver device of claim 44 ~~45~~ wherein the template for a codeword is a matched filter for the codeword.

48. (currently amended) The DTV receiver device of claim 44 ~~45~~ further comprising:

a comparator coupled to the bank of correlators and adapted to determine ~~for determining~~ which of the correlations produced by the bank of correlators has the strongest peak.

49. (currently amended) The DTV receiver device of claim 44 ~~45~~ wherein the front end comprises:

an antenna;

a mixer coupled to the antenna and adapted to downconvert ~~for downconverting~~ the received DTV signal; and

a sampler coupled between the mixer and the bank of correlators and adapted to sample ~~for sampling~~ the downconverted DTV signal.

50. (currently amended) The DTV receiver device of claim 49 wherein the sampler includes:

an I channel and a Q channel adapted to produce ~~for producing~~ I and Q samples of the downconverted DTV signal.

51. (currently amended) The DTV receiver device of claim 44 ~~45~~ wherein

the front end comprises a sampler adapted to sample ~~for sampling~~ the DTV signals; and

each correlator within the bank of correlators comprises:

a tap delay line having a parallel output adapted to receive and store ~~for receiving and storing~~ samples of a data segment; and

a multiply and sum device coupled to the parallel output of the tap delay line and adapted to correlate ~~for correlating~~ the data segment against a template for a codeword.

52. (currently amended) The DTV receiver device of claim 51 wherein the tap delay line is further adapted to store ~~stores~~ samples for an entire data segment.

53. (currently amended) The DTV receiver device of claim 44 ~~45~~ further comprising:

a field synchronization correlator coupled to the antenna and adapted to correlate ~~for correlating~~ the data segments against a template for a field synchronization segment, wherein the DTV signal includes a field synchronization segment which repeats once every N segments;

a bank of accumulators coupled to the field synchronization correlator and adapted to accumulate ~~for accumulating~~ the correlations to produce N partial sums, each partial sum reflecting a sum of peaks of every Nth correlation;

a comparator coupled to the bank of accumulators and adapted to determine ~~for determining~~ which of the N partial sums is the largest to identify the field synchronization segment; and

a counter coupled to the antenna and the comparator and adapted to determine ~~, for determining~~ a numerical position of data segments with respect to the field synchronization segment, wherein only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment.

54. (currently amended) The DTV receiver device of claim 44 ~~45~~ further comprising:

a field synchronization correlator coupled to the antenna and adapted to correlate ~~for correlating~~ the data segments against a template for a field synchronization segment, wherein the DTV signal includes a field synchronization segment which repeats once every N segments;

a bank of counters coupled to the field synchronization correlator and adapted to generate ~~for generating~~ N counts from the correlations, each count reflecting a number of times every Nth correlation exceeds a threshold;

a comparator coupled to the bank of counters and adapted to determine ~~for determining~~ which of the N counts is the largest to identify the field synchronization segment; and

a counter coupled to the antenna and the comparator and adapted to determine ~~, for determining~~ a numerical position of data segments with respect to the field synchronization segment, wherein only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment.

55. (currently amended) The DTV receiver device of claim 44 ~~45~~ wherein:

the front end comprises a sampler adapted to sample ~~for sampling~~ the DTV signals; and

the bank of correlators comprises a DSP processor programmed to correlate the data segments against templates for the codewords.

56. (new) A DTV transmitter device for inserting digital data into a digital television (DTV) broadcast signal, the DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, the DTV transmitter device comprising:

an encoder adapted to encode the digital data as codewords; and

a packet multiplexer adapted to replace data segments within the DTV signal with the codewords.

57. (new) The DTV transmitter device of claim 56 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

58. (new) The DTV transmitter device of claim 56 wherein the encoder is further adapted to:

divide the digital data into bit sequences; and

encode each bit sequence as a corresponding codeword selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence.

59. (new) The DTV transmitter device of claim 58 wherein the codewords in the finite set are orthogonal to each other.

60. (new) The DTV transmitter device of claim 58 wherein the codewords in the finite set are a same length as the data segments.

61. (new) The DTV transmitter device of claim 58 wherein:

each bit sequence is N bits long, and

there are 2^N codewords corresponding to the bit sequences.

62. (new) The DTV transmitter device of claim 56 wherein the packet multiplexer is further adapted to:

select data segments according to their numerical position within a frame; and

replace only the selected data segments with codewords.

63. (new) The DTV transmitter device of claim 56 wherein the packet multiplexer is further adapted to:

determine whether a data segment is unused; and

replace only unused data segments with codewords.

64. (new) Computer-readable media embodying instructions executable by a computer to perform a method for inserting digital data into a digital television (DTV) broadcast signal, the DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, the method comprising:

encoding the digital data as codewords; and

replacing data segments within the DTV signal with the codewords.

65. (new) The media of claim 64 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

66. (new) The media of claim 64 wherein the step of encoding the digital data as codewords comprises:

dividing the digital data into bit sequences; and

encoding each bit sequence as a corresponding codeword selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence.

67. (new) The media of claim 66 wherein the codewords in the finite set are orthogonal to each other.

68. (new) The media of claim 66 wherein the bit sequences are all of the same length.

69. (new) The media of claim 66 wherein the codewords in the finite set are a same length as the data segments.

70. (new) The media of claim 66 wherein the step of replacing data segments with codewords comprises:

replacing each data segment with at least two codewords.

71. (new) The media of claim 66 wherein:

each bit sequence is N bits long, and

there are 2^N codewords corresponding to the bit sequences.

72. (new) The media of claim 66 wherein the step of encoding each bit sequence as a corresponding codeword comprises:

selecting the codeword from a lookup table which matches bit sequences with their corresponding codewords.

73. (new) The media of claim 66 wherein each codeword represents not more than three bits of digital data.

74. (new) The media of claim 66 wherein each codeword comprises multi-amplitude symbols.

75. (new) The media of claim 64 wherein the step of replacing data segments with codewords comprises:

selecting data segments according to their numerical position within a frame; and

replacing only the selected data segments with codewords.

76. (new) The media of claim 64 wherein the step of replacing data segments with codewords comprises:

determining whether a data segment is unused; and

replacing only unused data segments with codewords.

77. (new) The media of claim 64 wherein the method further comprises:

broadcasting the DTV signal.

78. (new) The media of claim 77 wherein the method further comprises:

receiving the broadcast DTV signal; and

recovering the digital data from the received DTV signal.

79. (new) Computer-readable media embodying instructions executable by a computer to perform a method for recovering digital data from a broadcast digital television (DTV) signal, the method comprising:

receiving a broadcast DTV signal comprising a plurality of frames, each frame comprising a plurality of data segments, wherein at least one data segment has been replaced by at least one codeword representing digital data;

selecting the data segments which have been replaced by codewords; and

recovering the digital data from the selected data segments.

80. (new) The media of claim 79 wherein the DTV signal comprises a signal selected from the group consisting of:

an American Television Standards Committee (ATSC) DTV signal;

a Digital Video Broadcast (DVB) DTV signal; and

a Direct Broadcast Satellite (DBS) DTV signal.

81. (new) The media of claim 79 wherein:

each codeword is selected from a finite set of codewords wherein:

each codeword corresponds to a specific bit sequence,

the codewords are all of the same length, and

each codeword is longer than its corresponding bit sequence; and

the step of recovering the digital data from the selected data segments comprises recovering the bit sequences from the selected data segments.

82. (new) The media of claim 81 wherein the codewords in the finite set are a same length as the data segments.

83. (new) The media of claim 81 wherein the step of recovering the bit sequences from the selected data segments comprises:

identifying which of the data segments in the received DTV signal have been replaced by codewords; and

for data segments identified as having been replaced by codewords:

correlating the data segment against a template for each codeword in the finite set of codewords; and

selecting the codeword corresponding to the template which produces the strongest correlation peak.

84. (new) The media of claim 83 wherein the template for a codeword is a matched filter for the codeword.

85. (new) The media of claim 83 wherein:

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position within a frame; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises determining which of the data segments occupy the preselected numerical positions within the frame.

86. (new) The media of claim 83 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

correlating the data segments against a template for the field synchronization segment;

accumulating the correlations to produce N partial sums, each partial sum reflecting a sum of peaks of every Nth correlation;

determining which of the N partial sums is the largest to identify the field synchronization segment; and

determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.

87. (new) The media of claim 83 wherein:

the DTV signal includes a field synchronization segment which repeats once every N segments;

only preselected data segments have been replaced by codewords, and the data segments are preselected according to their numerical position with respect to the field synchronization segment; and

the step of identifying which of the data segments in the received DTV signal have been replaced by codewords comprises:

correlating the data segments against a template for the field synchronization segment;

generating N counts from the correlations, each count reflecting a number of times every Nth correlation exceeds a threshold;

determining which of the N counts is the largest to identify the field synchronization segment; and

determining which of the data segments occupy the preselected numerical positions with respect to the field synchronization segment.